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ACTION OF HALOGENS ON METHYLAMINO PARA PHENOL SULPHATE

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THE action of chlorine, bromine and iodine under alkaline conditions on methylamino para phenol sulphate (metol) gave some unexpected results. Although halogens are oxidising agents, hydroquinone was obtained as one of the reaction products.

Metol (0.5 g) was dissolved in distilled water (25 ml) in a conical flask wrapped in a black paper. Alkaline solution of bromine (50 ml, 0.1 N sodium hypobromite) was added dropwise over a period of 3 hr to the metol solution under stirring at 30°C. The reaction mixture was kept in the dark for about 20 hr. It was then acidified with H₂SO₄ (3 ml, 2 N) and evaporated on steam bath. The residue was extracted with hot toluene (50 ml, 90-100°C). The toluene extract on cooling gave white needle-shaped crystals. The compound was identified as *p*-dihydroxy benzene (hydroquinone (I)). The yield was about 7%, m.p. 171°C. The elemental analysis showed 65% C, 5% H (expected for (I) is 65.45% C and 5.45% H). The diacetyl derivative of (I) was prepared, m.p. 123°C (lit. value 123°C). The identity of compound (I) was proved by its UV spectrum (absorption maxima at 221 nm and 289 nm as recorded on Perkin Elmer 550).

Hydroquinone was obtained even when 0.1 N sodium hypochlorite or hypoiodite solutions were used. It was interesting to note that the yield of hydroquinone decreased in the decreasing electronegativity of halogens. The yield was 10%, 7%, 3% with chlorine bromine and iodine respectively. Looking at the comparatively poor yield of hydroquinone, a blank experiment was carried out by adding only NaOH solution (25 ml, 0.1 N) to the metol solution, other experimental conditions remaining the same. Hydroquinone was not obtained.

The action of bromine on *p*-AcNHC₆H₄OH has been studied earlier¹. In addition to bromo derivative of the starting compound, tetrabromoquinone and also tetrabromohydroquinone were isolated from the reaction mixture. The formation of hydroquinone however was not reported earlier.

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RECORD OF A NEW DISEASE OF LEMONGRASS (*CYMBOPOGON FLEXUOSUS* STAFF) CAUSED BY *CURVULARIA VERRUCIFORMIS* AGARWAL AND SAHNI

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A NEW leaf spot disease was observed on the plants during September 1978 in the experimental field of this laboratory. The disease appeared again in September 1979 and subsequent years causing extensive damage to the crop. The field observations indicated that the disease was recognised initially as small pink-coloured circular spots on the leaf surface. As the disease advanced, the pink-coloured spot turned brown, enlarged, elongated and spread to form brown patches. Gradually, the colour of the leaves changed to brown resulting in dry leaves. Small black fruiting bodies were also observed under the surface of the leaves in the later stage of infection.

The fungus was isolated from the infected lesions on potato-dextrose-agar (PDA) medium and purified by hyphal tip culture. The fungus was grown at 20°C (±1°C) and the colony was initially white but turned black after 3-4 days of incubation. The fungus grew well with sporulation upto 30°C after which the growth deteriorated.

Microscopic examinations of the fungus culture yielded a species of *Curvularia*. The mycelium was pale brown to black in colour, branched and septate. The conidia were brown to black in colour, 3-4 septate, ovoid and curved and thick walled. The middle cells were larger while the apical cells were conical in shape (figure 1). The size of the conidia was 16.2-18.9 μ × 8.1-9.45 μ. The pathogenicity of this fungus

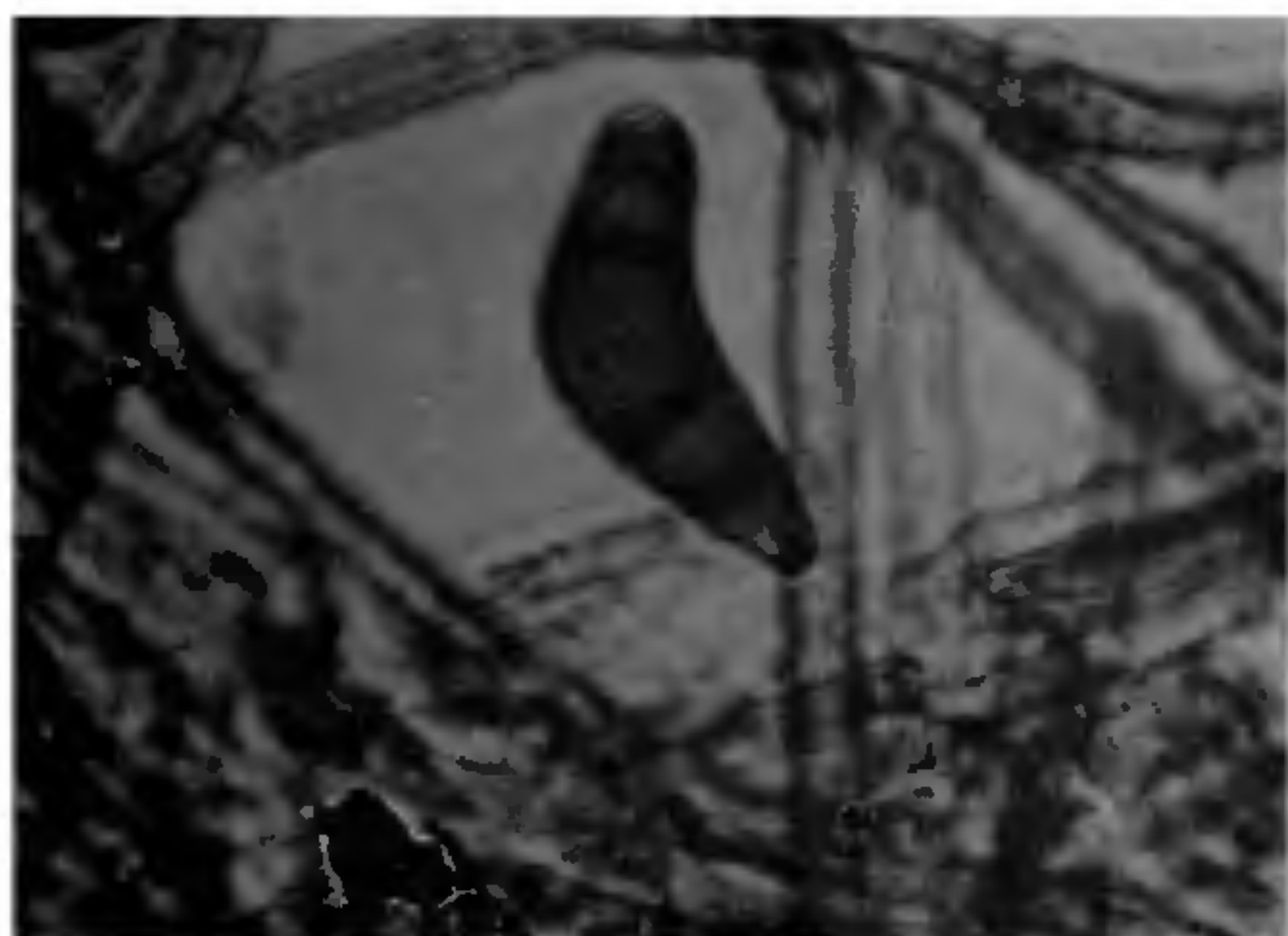


Figure 1 Conidium and mycelium of *C. verruciformis* Agarwal & Sahni ($\times 1000$)

was proved by artificial inoculation of healthy plants with the spore suspension. The culture had been identified as *Curvularia verruciformis* Agarwal and Sahni (IMI No-269261).

Literature study showed that this fungus was first reported from India¹ in wheat. Subsequently, Roy *et al.*² reported that this fungus infected the rice grain in the N. E. Region. Therefore, this is the first report that the ring spot and blight disease of Lemongrass is caused by *C. verruciformis* Agarwal and Sahni. Further investigation on host-parasite relationship is in progress.

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APHYLLOPHORALES OF KUMAUN HILLS-III

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EARLIER, workers¹⁻³ have reported some Aphylloraceous fungi from Kumaun region. This paper is in continuation of our exhaustive study of wood-

decaying fungi of Kumaun region^{4,5}. In this note three more wood-decaying fungi, viz., *Amyloporia crassa* var. *subimbricata* Dom., *Spongipellis borealis* (Fr.) Pat. and *Tyromyces caesius* (Schrad. ex Fr.) Murr. have been described in detail. The fungi were isolated by tissue culture method on tea agar medium⁶ and the cultural characters have been described according to Nobles⁷ pattern. The collection has been deposited in the Herbarium, Botany Department, Kumaun University, Naini Tal.

1. *Amyloporia crassa* var. *subimbricata* Dom., Grzyby, 92-95, 1965. (figures 1,2 and figures 7-14).

Fruit body perennial, corky when fresh, rigid on drying, pileus effused, becoming tuberculate, somewhat globose or irregular in shape, dirty white to creamish; subiculum up to 10 mm thick, and if on a rough surface, the mycelium penetrating the surface forms a pseudosubiculum which seems to be added by a filling of the old tube layers, corky, homogenous; hymenophore poroid, white when fresh, slightly darkening with age, pores circular to oval, rarely angular, 5-7 per mm, dissepiments thin and entire, tubes 1-1.5 mm long; hyphal system dimitic, generative hyphae hyaline, thin-walled, sparingly branched, septate 2.5-4 μm broad; skeletal hyphae hyaline, thick-walled, 4-6.5 μm broad; basidia hyaline, clavate, 12-17 \times 4-5.5 μm , 2-4 sterigmate; basidiospores hyaline, smooth, thin-walled, emyloid, ellipsoid to narrow-ellipsoid, 5-7 \times 2-3.5 μm ; cystidia hyaline, sharp-pointed, paraphysis-like or hyphal in nature, 15-24 \times 3.5-7.5 μm .

Key pattern: 2,1,2,1,9,2,2,2,2,2,2.

Growth characters: Growth moderately rapid, plate covered in 2-3 weeks, advancing zone even, hyaline appressed; mat white, appressed, soft and cottony; no fruiting; reverse unchanged; odour none; no diffusion zone. Advancing zone: hyphae hyaline, thin-walled, branched, septate, clamped, 3-4 μm broad. Aerial mycelium: (a) hyphae as in the advancing zone but rarely clamped, (b) fibre hyphae hyaline, thick-walled, aseptate, unbranched, not clamped, 5.5-6.5 μm broad. Submerged mycelium: (a) hyphae as in the advancing zone, (b) tetrahedral crystals present.

Habit and habitat: On a fallen log of *Pinus roxburghii* Sarg., Kasar Devi, Almora, N 16, 6 December 1978, Snow View, Naini Tal, N 514, 28 October 1981.

2. *Spongipellis borealis* (Fr.) Pat., *Essai Tax. Hym.* 1900. (figures 3-4 and figures 15-27)

Fruit body annual, flabelliform to dimidiate; pileus substipitate, narrowed at the base, rarely sessile, watery-tough when fresh becoming fibrous-tough on drying 3.5-12 \times 3-10 \times 0.5-2 cm; upper surface white, sometimes yellowish or brownish, coarsely hispid to tomentose, becoming glabrous in herbarium, spongy